

REMARKS

Claims 1-13 are pending in this application. The Examiner maintains the 35 U.S.C. § 103(a) rejection of claims 1-13 as being unpatentable over Paoli in view of Thornton and Coman et al. (Coman). The Examiner also formulates a new 35 U.S.C. § 112, second paragraph, rejection of claims 1-13 as being indefinite allegedly because in independent claims 1, 6 and 13 “[i]t is not clear within the claim language, how the wavelength is selected” (see Office Action, page 3).

With regard to the Examiner’s § 112, second paragraph, rejection, Applicant respectfully submits that one skilled in the art of multiple wavelength surface-emitting laser devices would readily appreciate that “selected resonance wavelength” refers to a resonance wavelength selected based on the intended use of the laser device. Nonetheless, Applicant amends claims 1, 6 and 13 to avoid the use of the allegedly unclear term “selected”. Also, Applicant amends claims 1, 6 and 13 to avoid the “whereby” phraseology in order to recite more positively the requirement that “the resonance wavelength is controlled by adjusting the thickness of the dielectric layers of the dielectric reflection layer”. These amendments are merely clarifying amendments and do not narrow the scope of claims 1, 6 and 13. No estoppel is created.

With regard to the prior art rejection, as in the previous Office Action, the Examiner acknowledges that “Paoli does not disclose obtaining different wavelengths by adjusting the DBR [distributed Bragg reflectors]”, and relies on Thornton as allegedly supplying this acknowledged deficiency (see Office Action, page 4). For the reasons set forth in the previous Amendment, filed December 3, 2003, Applicant respectfully maintains that the Examiner’s prior

art rejection is incorrect. The Examiner's latest analysis of Thornton and interpretation of the requirements of Applicant's claims 1, 6 and 13 do not bolster the Examiner's previous position (see Office Action, pages 2 and 3). Thus, Applicant respectfully traverses the Examiner's prior art rejection as follows.

In response to the arguments presented in the Amendment filed December 3, 2003, the Examiner alleges that Thornton, at col. 3, lines 57-65 and col. 4, line 58 through col. 5, line 2, teaches "how the different wavelengths of the semiconductor laser are selected" (see Office Action, page 2, lines 9-13). In particular, the Examiner refers to Thornton's Fig. 3 to conclude that "Figure 3 illustrates the mirrors having different thickness for optimizing the selected wavelength" (see Office Action, page 2, lines 18-21, emphasis added).

However, this conclusion is not supported by Thornton's actual disclosure. As explained in Applicant's Amendment filed December 3, 2003, Thornton discloses a conventional multiwavelength semiconductor laser where:

tricolor laser structure is realized by leaving the entire structure intact for a long wavelength laser 40, removing the topmost active layer or longest wavelength structure 15 for a middle wavelength laser 41, and removing the two uppermost active regions layers 15, 14 for the shortest wavelength laser 42. Now, by replacing the lower waveguiding layer 12 of FIG. 2 with a distributed Bragg reflector (DBR) mirror 52 of sufficiently broad bandwidth, and depositing dielectric stack mirrors 44, 45, 46 on the exposed surfaces, respectively, of the three active regions 15, 14 and 13, then three vertical cavity surface emitting lasers result, with the direction of the output beams at wavelengths λ_1 , λ_2 and λ_3 indicated, respectively, by the arrows 47, 48, 49. The mirrors 44-46 are conveniently deposited by known electron beam deposition. The mirrors would be adjusted *in wavelength* to be optimal at the respective wavelengths of their emitting laser region.

(Id., col. 4, line 52 through col. 5, line 2, emphasis added)

That is, nowhere does Thornton disclose, teach or suggest that **the thickness** of its mirrors 44-46 has anything to do with optimizing the selected wavelength. In fact, as further explained in Applicant's December 3, 2003 Amendment at page 9, Thornton discloses quite the opposite:

... selection of a particular wavelength output is easily obtained by selectively disabling longer wavelength active regions [13-15], if any, to access or enable the active region of the desired wavelength.

It will also be appreciated that the mirror formed by the stack of dielectric layers is not critical to this aspect of the invention. The top mirror can also be formed, for example, by a stack of semiconductor layers functioning to reflect radiation, or by a DBR stack, or by a III-V semiconductor compound layer.

(Id., col. 5, lines 17-27, emphasis added).

The Examiner states that Applicant's arguments set forth on page 9 of the Amendment filed December 3, 2003 "are irrelevant because Thornton is discussing a different embodiment for obtaining a single wavelength" (see Office Action, page 3, lines 1-3). Applicant respectfully disagrees.

Contrary to the Examiner's analysis, the disclosure set forth at col. 5, lines 17-27 of Thornton describes a "further feature" of the structure shown in Fig. 3 (which the Examiner cites for the alleged teaching of mirrors having different thickness for optimizing the selected wavelength) when used "in combination in a monolithic body with multiple active regions" (see Id., col. 5, lines 13-17). On the other hand, the "single wavelength" embodiment of Thornton is described starting at col. 5, line 66.

Thus, the Examiner's piecemeal analysis of Thornton is not only improper, but is contrary Thornton's actual disclosure.

Finally, the Examiner alleges that "applicant does not claim that the thickness of the dielectric reflection layer selects the wavelengths ..." (see Office Action, page 2, lines 20-22). Again, Applicant respectfully disagrees. In fact, Applicant's independent claims 1, 6 and 13 explicitly require that "the resonance wavelength is **controlled by** adjusting the thickness of the dielectric layers of the dielectric reflection layer" (Id., emphasis added).

In summary, Applicant's independent claims 1, 6 and 13, as well as the dependent claims 2-8 and 7-12 (which incorporate all the novel and unobvious features of their respective base claims 1 and 6) would not have been obvious from any reasonable combination of Paoli, Thornton and Coman, at least for the reasons set forth above and in the Amendment filed December 3, 2003.

Accordingly, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

Amendment Under 37 C.F.R. § 1.116
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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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